

REMARKS

The applicants propose amending claims 1, 10, 15 and 16 to improve form. Claims 1 and 3-21 remain pending upon entry of this amendment.

Claim 15 has been objected to for minor informalities. In particular, the Final Office Action states that claim 15 should be made dependent on claim 11 and that the term "first conductive layer" should be changed to "conductive layer". Claim 15 has hereby been amended in accordance with the Examiner's suggestions. Accordingly, withdrawal of the objection is respectfully requested.

Claims 10, 12 and 13 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Lee et al. (U.S. Patent Publication No. 2002/0028541; hereinafter Lee). The rejection is respectfully traversed.

Claim 10, as amended, recites a feature similar to a feature recited in claim 1, which was not rejected based on Lee. Therefore, claim 10 as amended, along with its dependent claims 12 and 13, is believed to be allowable over Lee. Accordingly, withdrawal of the rejection of claims 10, 12 and 13 based on Lee is respectfully requested.

Claims 1, 4, 5, and 16-21 have been rejected under 35 U.S.C. § 102(e) as being anticipated by or in the alternative under 35 U.S.C. § 103(a) as being unpatentable over Hagemeyer (U.S. Patent No. 6,768,166). The rejection is respectfully traversed.

Claim 1, as amended, recites that the conductive structure has a cylindrical shape and is formed on the first conductive layer. Claim 1 also recites that the conductive structure has a first end and a second end opposite the first end, where the first end is disposed adjacent the portion of

the first conductive layer that acts as the source region for the memory device and the second end acts as a drain region for the memory device. Claim 1 also recites that the plurality of dielectric layers are formed around at least a portion of the conductive structure, where at least one of the dielectric layers acts as a floating gate electrode for the memory device. Claim 1 also recites that a top portion of the second end of the conductive structure does not contact any of the plurality of dielectric layers.

As to claim 1, the Final Office Action states that the combination of elements 104, 109 and 901 of Hagemeyer are equivalent to the claimed conductive structure and layers 105-107 are equivalent to the claimed plurality of dielectric layers (Final Office Action – page 5). The Final Office Action also states that if the term “substantially cylindrical” is interpreted broadly, portion 104 of the combination of elements 104/109/901 satisfies the claimed feature, but otherwise, claim 1 would still be obvious over Hagemeyer since the application has not pointed out any advantages associated with the shape of the structure (Final Office Action – page 5). The applicants respectfully disagree.

Initially, claim 1, amended as proposed, recites that the conductive structure has a cylindrical shape. Therefore, the applicants assume that the rejection of claim 1 under 35 U.S.C. §102(e) based on Hagemeyer would be withdrawn upon entry of this Amendment.

As to the alternative rejection under 35 U.S.C. §103(a), the applicants assert that element 901 of Hagemeyer is a contact hole 901 formed above structure 104/109 (Hagemeyer – col. 7, lines 10-11). The applicants further assert that contact hole 901 cannot be fairly construed to be part of a conductive structure having a first end and a second end, where the first end is disposed adjacent the

portion of a conductive layer that acts as the source region for the memory device and the second end acts as a drain region for the memory device, as required by claim 1. More particularly, structure 901 does not act as a drain region for the device of Hagemeyer, as would be required based on the Examiner's statement that structure 901 forms part of the claimed conductive structure and the fact that Hagemeyer discloses that element 103 functions as the source region (Hagemeyer – col. 4, lines 32-38).

Therefore, without addressing the allegation that it would have been obvious to form contact 901 with a cylindrical shape, the applicants assert that contact 901 cannot be fairly construed to form part of the conductive structure recited in claim 1.

Claim 1 also recites that that a top portion of the second end of the conductive structure does not contact any of the plurality of dielectric layers. The Final Office Action states that contact 901 of Hagemeyer does not contact any of the plurality of dielectric layers (Final Office Action – page 6).

Contact 901 of Hagemeyer, as discussed above, cannot be fairly construed to be part of the claimed conductive structure. Therefore, the mere fact that contact 901 does not contact any of dielectric layers 105-107 is not relevant to the claimed feature. As further discussed in the previous response, Hagemeyer discloses that channel region 104 and drain region 109 contact dielectric layer 105 along the entire length of channel region 104 and drain region 109 (Hagemeyer – Figs. 1 and 5-9). Hagemeyer, therefore, does not disclose or suggest that the top portion of either channel region 104 or drain region 109 does not contact dielectric layer 105, as required by claim 1.

For at least the reasons discussed above, Hagemeyer does not disclose or suggest each of the features of claim 1. Accordingly, withdrawal of the rejection of claim 1 under 35 U.S.C. §102(e) and §103(a) is respectfully requested.

Claims 4 and 5 are dependent on claim 1 and are believed to be allowable for at least the reasons claim 1 is allowable. Accordingly, withdrawal of the rejection and allowance of claims 4 and 5 are respectfully requested.

Claim 16 recites features similar to claim 1. For example, claim 16 recites that each of the plurality of structures functions as a channel region for one of the memory cells and a top portion of each of the plurality of structures does not contact any of the plurality of dielectric layers. For reasons similar to those discussed above with respect to claim 1, Hagemeyer does not disclose or suggest these features of claim 16. Accordingly, withdrawal of the rejection and allowance of claim 16 are respectfully requested.

Claims 17-21 are dependent on claim 16 and are believed to be allowable for at least the reasons claim 16 is allowable. In addition, these claims recite additional features not disclosed or suggested by Hagemeyer.

For example, claim 20 recites that each of the plurality of structures functions as a drain region for one of the memory cells. For reasons similar to those discussed above with respect to claim 1, Hagemeyer does not disclose or suggest this feature. For at least this additional reason, withdrawal of the rejection and allowance of claim 20 are respectfully requested.

Claims 3 and 6-8 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Hagemeyer. The rejection is respectfully traversed.

Claims 3 and 6-8 are dependent on claim 1 and are believed to be allowable for at least the reasons claim 1 is allowable. In addition, these claims recite additional features not disclosed or suggested by Hagemeyer.

For example, as to claim 3, the Final Office Action admits that Hagemeyer does not disclose that structure 104/109 has a thickness ranging from about 100 Å to about 1000 Å and a width ranging from about 100 Å to about 1000 Å and that Hagemeyer discloses that structure 104/109 has a thickness and width of 1500 Å (Final Office Action – page 8). The Final Office Action, however, states that the applicants have not disclosed any criticality associated with the claimed thicknesses and width associated with the claimed conductive structure and therefore any change in sizes would have been obvious at the time of the invention (Final Office Action – page 8). The applicants respectfully disagree.

As discussed in the previous response, the ranges recited in claim 3 enable the claimed memory device to be formed in a much smaller area than that which could be achieved by the structure disclosed in Hagemeyer and enable the present invention to achieve increased circuit density as compared to devices such as Hagemeyer. The applicants maintain that the 1500 Å diameter for channel region 104 in Hagemeyer is significantly larger than the range recited for the conductive structure in claim 3 and that nothing in Hagemeyer suggests modifying the 1500 Å diameter channel region 104 to the range recited in claim 3. The applicants further maintain that such a significant modification to the size of channel region 104 of Hagemeyer would not have been obvious to one of ordinary skill in the art based on the disclosure of Hagemeyer.

For at least these additional reasons, withdrawal of the rejection and allowance of claim 3 are respectfully requested.

Claims 9-15 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Hagemeyer in view of Forbes (U.S. Patent Publication No. 2003/0235075). The rejection is respectfully traversed.

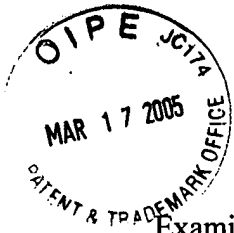
Claim 9 is dependent on claim 1 and is believed to be allowable for at least the reasons claim 1 is allowable. Forbes does not remedy the deficiencies in Hagemeyer discussed above with respect to claim 1. Accordingly, allowance of claim 9 is respectfully requested.

Claim 10, as amended, recites features similar to claim 1. For reasons similar to those discussed above with respect to claim 1, Hagemeyer does not disclose or suggest each of the features of amended claim 10. Forbes does not remedy the deficiencies in Hagemeyer with respect to claim 10. Accordingly, withdrawal of the rejection and allowance of claim 10 are respectfully requested.

Claims 11-15 are dependent on claim 10 and are believed to be allowable over the combination of Hagemeyer and Forbes for at least the reasons claim 10 is allowable. Accordingly, withdrawal of the rejection and allowance of claims 11-15 are respectfully requested.

CONCLUSION

The applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered, placing the application in condition for allowance. The applicants submit that the proposed amendment does not raise new issues or necessitate any additional search of the art by the

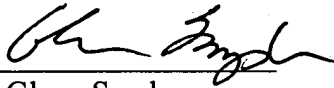


Examiner. Furthermore, the applicants submit that entry of this Amendment would place the application in better form for appeal in the event that the application is not allowed. If the Examiner does not believe that all pending claims are now in condition for allowance, the Examiner is urged to contact the undersigned attorney to expedite prosecution of this application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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Date: March 17, 2005

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